Environmental Guidance Note – Acid Sulphate Soils

HSE DOCUMENT

Acid Sulphate Soil is the common name given to a range of soil types containing iron sulphides and/or their oxidation products. Chemical reactions associated with changing sea levels in the geological past produced iron sulphides in waterlogged sediments. When exposed to air, these sulphides and oxides may produce sulphuric acid, hence the name acid sulphate soils.

Acid sulphate soils are generally found in:

- Coastal lowlands, embayments and estuarine floodplains;
- Areas where the level of land is below 5m Australian Height Datum (AHD);

The sulphuric acid produced by oxidation of iron sulphides affects soil and water and can severely damage the environment. As sulphuric acid moves through the soil, it mobilises iron, aluminium, manganese and other heavy metals from mineral sources. Acidic and metal-rich waters can be highly detrimental to flora and fauna.

Indicators of acid sulphate soil presence/risk

- PASS/ ASS shown on mapping,
- Mangroves or swamp vegetation or marine/estuarine sediments,
- Rotten egg smell after rain (following a dry spell) or when soils are disturbed,
- Soft blue/grey or dark greenish grey soils (can be sands and gravels),
- Milky blue/green water,
- Shell fragments in the soil,

- Waterlogged, scalded or back-swamp areas,
- Land below 5m Australian height datum (AHD) elevation,
- Any jarosite (a pale yellow mineral deposit) or iron oxide (rusty) mottling of the soil,
- Extensive iron stains on surfaces or iron stained water and ochre deposits,
- Corrosion of concrete and/or steel structures, and
- Surface or ground water with either a pH below 5.5 or that is *unusually* clear.

If ASS are suspected or shown on mapping follow the controls below

- Assess the soil and water risks present or potential risks on the work site (refer to TSS Mapping and Local government mapping)
- Minimise the areas disturbed and keep excavation as shallow as possible
- Keep spoil layers segregated and backfill in the same order
- Re-bury soil at the same depth from which it was excavated
- Separate ASS from other spoil

- Minimise time that soils are exposed to air by staging works and storing soils in a lined and covered skip bin or wrapped in plastic.
- If excavation/disturbance is >1 tonne of soil OR excavation connected directly with a creek, drain wetland or waterbody a site specific ASS Management Plan may be required. Contact an Environment Business Partner for advice.
- When excavating in areas known to contain ASS, replace soils at the same depth from which they were excavated. Avoid mixing soils from different depths.